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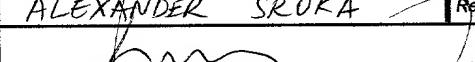
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UTILITY PATENT APPLICATION TRANSMITTAL <small>(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))</small>	Attorney Docket No.
	First Inventor or Application Identifier ALEXANDER SROKA
	Title Self-Organizing & Auto-Cross-Ref-Information MAN. SYS.
	Express Mail Label No.

APPLICATION ELEMENTS <small>See MPEP chapter 600 concerning utility patent application contents.</small>	ADDRESS TO: Assistant Commissioner for Patents Box Patent Application Washington, DC 20231	
1. <input checked="" type="checkbox"/> * Fee Transmittal Form (e.g., PTO/SB/17) <small>(Submit an original and a duplicate for fee processing)</small>	5. <input type="checkbox"/> Microfiche Computer Program (Appendix)	
2. <input checked="" type="checkbox"/> Specification <small>[Total Pages 36]</small> <small>(preferred arrangement set forth below)</small> <ul style="list-style-type: none">- Descriptive title of the Invention- Cross References to Related Applications- Statement Regarding Fed sponsored R & D- Reference to Microfiche Appendix- Background of the Invention- Brief Summary of the Invention- Brief Description of the Drawings (if filed)- Detailed Description- Claim(s)- Abstract of the Disclosure	6. Nucleotide and/or Amino Acid Sequence Submission <small>(if applicable, all necessary)</small> <ul style="list-style-type: none">a. <input type="checkbox"/> Computer Readable Copyb. <input type="checkbox"/> Paper Copy (identical to computer copy)c. <input type="checkbox"/> Statement verifying identity of above copies	
3. 18 Drawing(s) (35 U.S.C. 113) <small>[Total Sheets 17]</small>	ACCOMPANYING APPLICATION PARTS 7. <input type="checkbox"/> Assignment Papers (cover sheet & document(s)) 8. <input type="checkbox"/> 37 C.F.R. § 3.73(b) Statement <input type="checkbox"/> Power of Attorney <small>(when there is an assignee)</small> 9. <input type="checkbox"/> English Translation Document (if applicable) 10. <input checked="" type="checkbox"/> Information Disclosure Statement (IDS)/PTO-1449 <input type="checkbox"/> Copies of IDS Citations 11. <input type="checkbox"/> Preliminary Amendment 12. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) <small>(Should be specifically itemized)</small> 13. <input checked="" type="checkbox"/> * Small Entity Statement(s) <input type="checkbox"/> Statement filed in prior application, Status still proper and desired <small>(PTO/SB/09-12)</small> 14. <input type="checkbox"/> Certified Copy of Priority Document(s) <small>(if foreign priority is claimed)</small> 15. <input checked="" type="checkbox"/> Other: SEARCHER'S WORKSHEET OLD PATENT COPY EXPRESS MAIL LABEL	
4. Oath or Declaration <small>[Total Pages 1]</small> <ul style="list-style-type: none">a. <input checked="" type="checkbox"/> Newly executed (original or copy)b. <input type="checkbox"/> Copy from a prior application (37 C.F.R. § 1.63(d)) <small>(for continuation/divisional with Box 16 completed)</small><ul style="list-style-type: none">i. <input type="checkbox"/> DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).		
* NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).		
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For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

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Signature		Date	8/10/00

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Sir:

Please file the following enclosed patent application papers:

Applicant #1, Name: Alexander Sroka
Other Applicant(s): None
Title: Self-Organizing and Automatically Cross-Referencing
Information Management System

- (X) Specification, Claims, and Abstract: Nr. of Sheets 36
(X) Declaration: Date Signed: 8/10/2000
(X) Drawing(s) 18: Number of Sheets Enclosed: (In Triplicate):
 Formal: 17
 Informal: 0
(X) Small Entity Declaration of Inventor(s)
() Small Entity Declaration of Non-Inventor / Assignee/Licensee
() Assignment; please record and return; recordal fee enclosed.
(X) Check for \$ 384 for:
 (X) \$ 345 for filing fee (not more than three independent claims and
 twenty total claims are presented; four independent claims – extra claim \$39).
 () \$ 0 Additional if Assignment is enclosed for recording.
(X) Return Receipt Postcard Addressed to Applicant #1.

(X) Request Under MPEP § 707.07(j): The undersigned, a pro-se applicant,
 respectfully requests that if the Examiner finds patentable subject matter disclosed in
 this application, but feels that Applicant's present claims are not entirely suitable, the
 Examiner draft one or more allowable claims for applicant.

Very respectfully,

Signature

Alexander Sroka

30350 Hunters Dr., Apt#3122 Farmington Hills, MI 48334

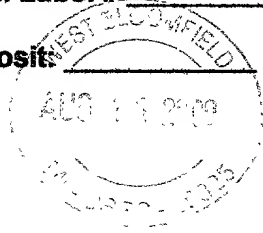
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**U.S. Patent Application of Alexander Sroka
for
Self-Organizing and Automatically Cross-Referencing
Information Management System**

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Background -- Field of Invention

This invention relates to computer programs, specifically to a computer information management systems which organize and access information stored in computer systems.

Computer systems sometimes organize data into categories and items related to such categories. Categories may be organized in hierarchies or structures. For example, category "Companies" may contain a list of specific company names, like "Financial Services, Inc.", "Environment Care Corp." and "Computer Maintenance, Inc.". Items are specific textual strings containing a single word, two, three or up to couple hundred words text, or other information pieces.

Prior art does not handle efficiently practically unlimited number of categories and items and/or cannot do cross-referencing for such large number of categories and items.

Background -- Description of Prior Art

Currently, the prevailing implementations for Information Management Systems handling diversified pieces of information on the personal computers are utilized in Personal Information Managers (PIM). No single product on the market fulfills the requirements of easy interface, database strength, extendibility, flexibility or other specific features, like practically unlimited number of categories and items or, most importantly, automatic storage of cross-referencing between categories and items.

There are/were the following major competitors in existing PIM's market for personal computers:

- Maximizer® -- with strong Btrieve database, no cross-referencing,
- Lotus Organizer® -- strong visual interface, no database, no cross-referencing,
- Act!® -- database, contact manager, no cross-referencing,
- Lotus Agenda® -- cross-referencing, unusable -- DOS based, no database, now defunct,
- ECCO® -- the best interface, no database,
- Lotus Notes® -- not a PIM, but intelligent e-mail and document storing.

On the low end of information managing and scheduling programs are:

- InfoCentral® -- information outlining,
- Schedule+® -- networked scheduling,
- Network Scheduler® 3 -- networked scheduling.

Lotus Agenda®, when it was available, is protected by the U.S. Pat. No. 5,115,504 issued to Belove et al. This patent is for a methodology which tries to accomplish a similar task, by a different system implemented in a DOS based database. The design of the system was cumbersome, limited to a linking file system and not utilizing the modern network data model design. It was creating more problems then it was solving.

Act! is recommended only for sale force automation, Maximizer is recommended for a broad spectrum of tasks, and Organizer is preferred by some users. Ease of interface is the single most important factor for the mass-market users. Then come the database and networking capabilities.

Summary Including Objects and Advantages

This invention is a specific software and/or hardware Database (Database) design and algorithms to access information in this Database. The Database is a model of the reality. The most prevalent characteristic of the Database is its **self-organizing** of information contained in the Database. The Database content is dynamic and effectively **changing the Database itself**. Humans always use **words** and phrases to describe the reality. The sentences are build primarily with **nouns** and **verbs**. The meaning of what is said depends on the **context** in which words are used, then it is concentrated on a particular **view** of the things and finally the things have their names. Database uses these words to **classify the information**. It is intuitive, but if somebody prefers to use a different naming convention, the Database can be adjusted by customizing it. The Database includes automatic cross-referencing algorithms to relate categories and items of information. Main design views of the Database are presented here – others, not presented here variations of main design are covered also by this invention. The look and feel of the computer programs which deal with user friendly spreadsheet presentation of the Database information and particularly Name and Context combo are described. Any computer system with means of implementing the invention is also described.

References Cited

U.S. Patent Documents

5,115,504 5/19/1992 Belove et al. 395/600

7 Claims 18 Drawings

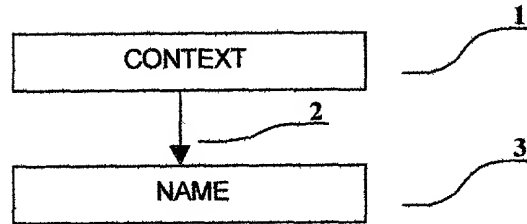


Figure 1. Category Structure

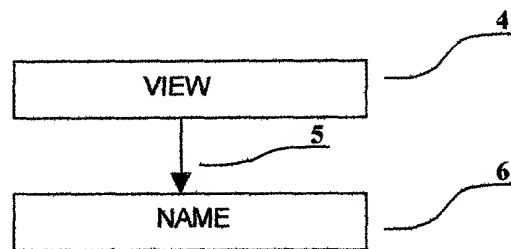


Figure 2. Standard Category Structure for the View Context

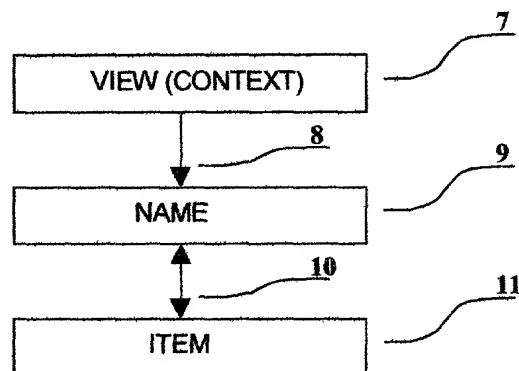


Figure 3. Structure of the Database Information Model.

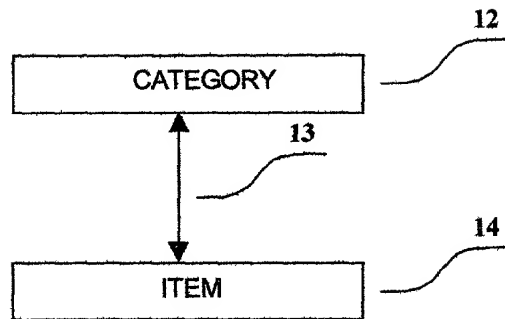


Figure 4. The Simplified Structure of the Database Information Model.

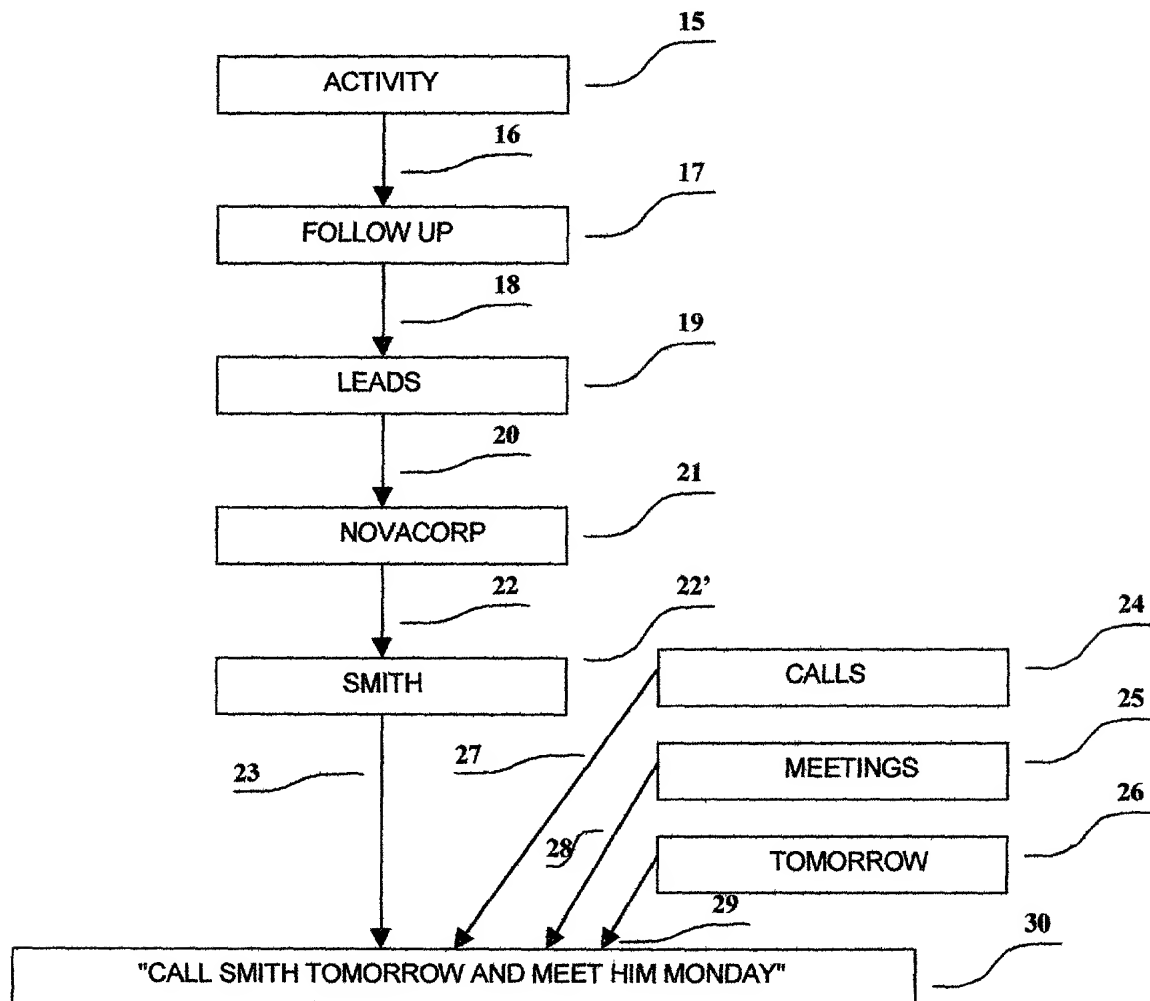


Figure 5. Structure of a sample category classification.

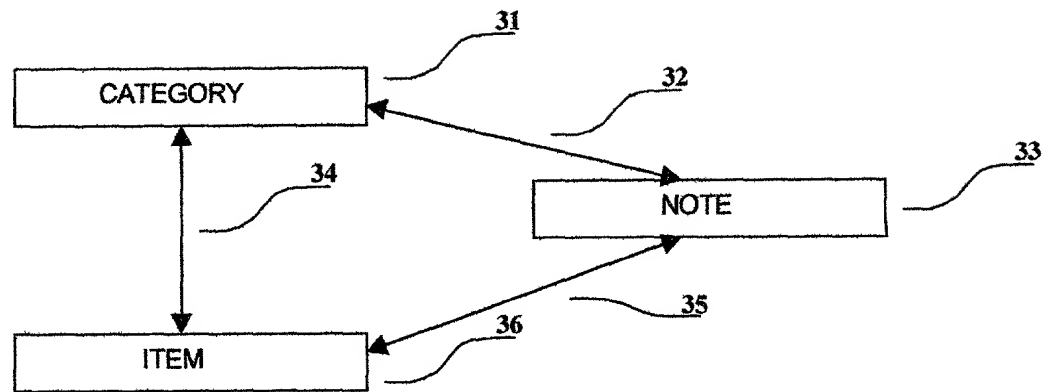


Figure 6. All Elements of the Simplified Database Information Model.

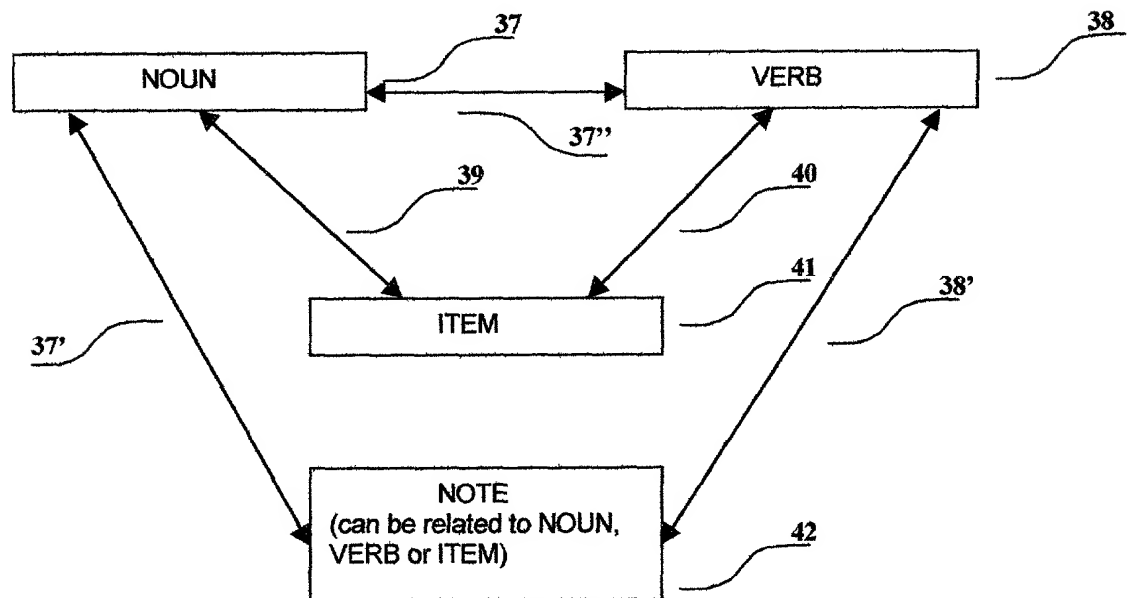


Figure 7. All Elements of the Database.

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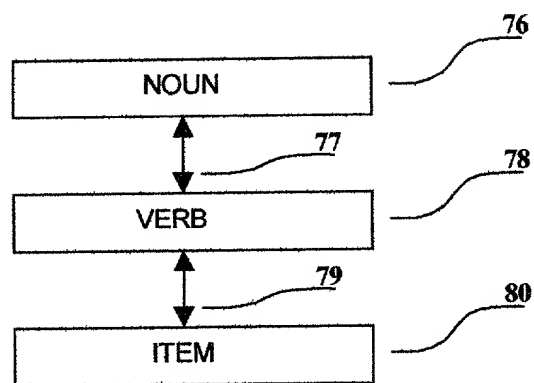


Figure 9. Quantified elementary information.

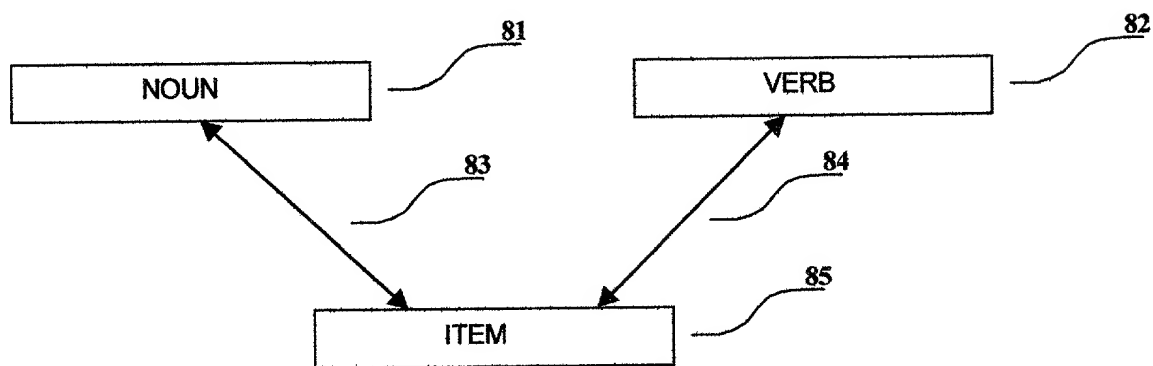


Figure 10. All Elements of the quantified elementary information.

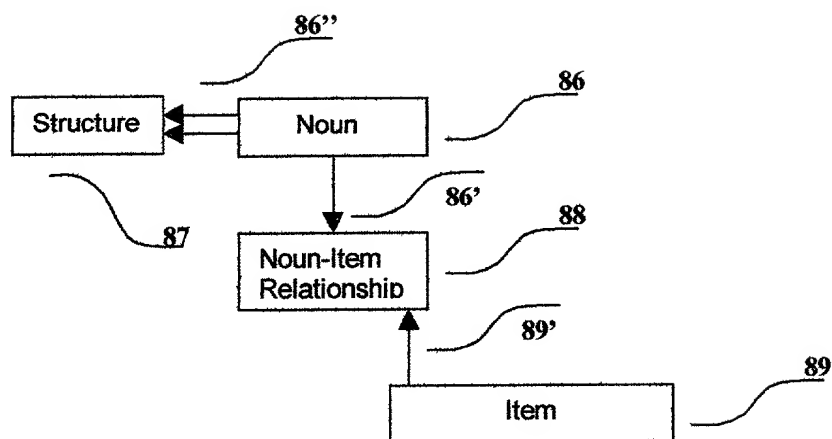


Figure 11. Illustration for the basic retrieval algorithm.

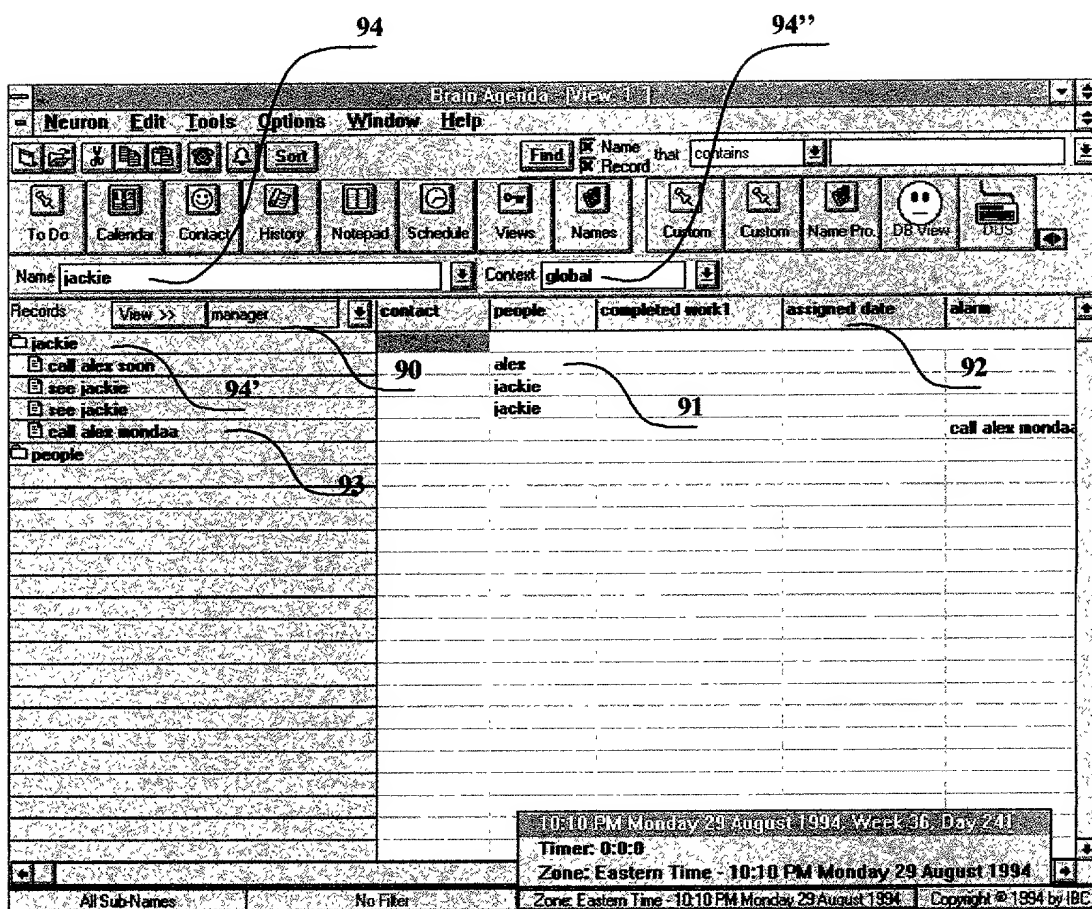


Figure 12. Two dimensional query results of the basic retrieval algorithm.

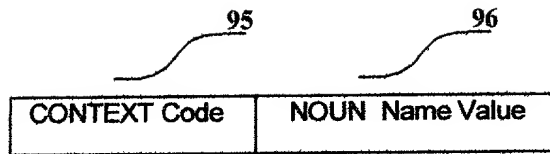


Figure 13. Basic structure of Noun (Verb) record.

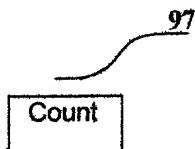


Figure 14. Basic structure of Relationship (or Structure) record containing usage count or certainty factor.

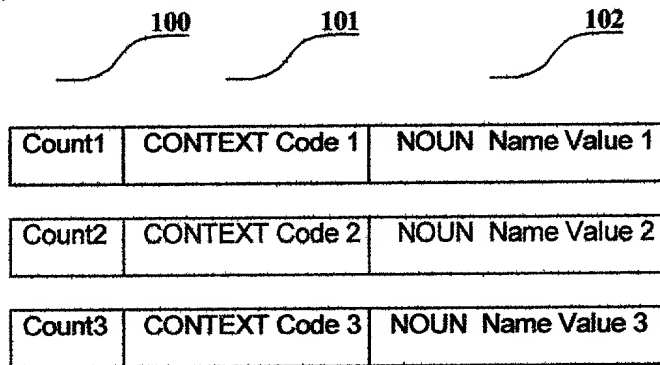


Figure 15. Product of Nouns (Verbs) and Structure of Nouns (Verbs); with three elements.

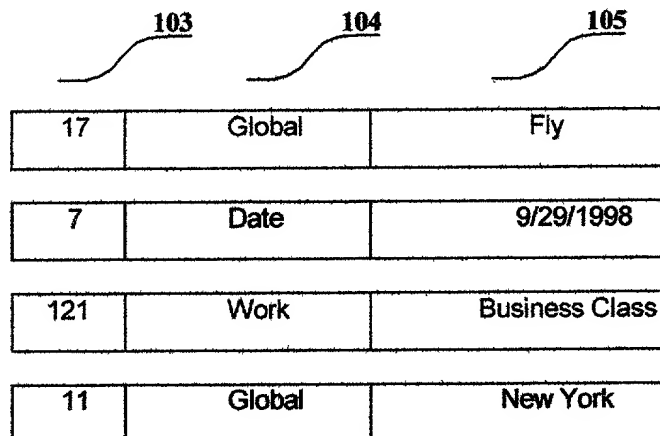


Figure 16. Example of product of Nouns (Verbs) and Structure of Nouns (Verbs); with four elements.

```

/******
/*
/*          BRAIN          Schema for the database BRAIN.
/*          Global schema for every neuron.
/*
/* Identification:
/*          1000-0-00-00-00
/*          ----- neuron 0001/.../1000
/*                               portion 0/1/2
/*                               relation 00/10/.../54
/*                               release 1
/*                               version 1
/*
/*          Portion      1
/*                          0          Abstraction
/*                          1          Reality
/*                          2          Abstraction-Reality relation
/*
/*          Part          11          Noun+Data+Doc
/*                          10          Noun
/*                          14          Noun-Data
/*                          15          Noun-Doc
/*                          40          Data
/*                          45          Data-Doc
/*                          50          Doc
/*
/*          Release      01
/*                          01          Alpha release
/*                          02          Beta release
/*
/*          Version      01
/*                          01          Alpha version
/*                          02          Beta version
/*
/******
/* Module name : Brain Agenda - Personal Information Manager
/*          NEURON_1000
/******
/* Implemented : RAIMA, db_VISTA III
/*
/* Compile type: ddp
/*          def. ddp -rx bds brain.ddl
/*          -r - report
/*          x - cross reference
/*          b - no alignment
/*          d - dupl. field names
/*          s - case preserve
/******
/* 1. | BRAIN | 1991.09.01 | New
/******
/* 1000-0-00-00-00 6144*/

```

```

database BRAIN [6144]
{
    data file "F100010.00" contains
/* 1000-0-10-00-00 */

    data file "F100011.00" contains
/* 1000-0-11-00-00 */

    data file "F100012.00" contains
/* 1000-0-11-00-00 */

    data file "F100019.00" contains
/* 1000-0-10-00-00 */
/* 1000-0-50-00-00 */

    key file "F100010.00K" contains
    key file "F100011.00K" contains
    key file "F100019.00K" contains

/******
/* Sub-schema : BRAIN - NOUN
/* Description : Noun (Parameter) part of BRAIN
/******
/* Record type : brain
/* Description : Start of the NEURON 1000
/******
    record brain
    {
        char          db_path [81];          /* Path to database          */
        char          db_name [81];          /* name of the db "brain"   */
        struct
        {
            long       type_v;               /* noun type, view id       */
            char        kname_v [41];        /* noun 40B + 1B null termin*/
            long        subtype_v;          /* noun subtype, def = 0    */
        } id_v;
        char           name_v [256];         /*
    struct
    {
        long           type_n;               /* noun type, name id       */
        char           kname_n [41];        /* noun 40B + 1B null termin*/
        long           subtype_n;          /* noun subtype, def = 0    */
        long           type2_n;            /* noun 2 type, def = 0     */
        char           kname2_n [41];       /* noun 40B + 1B null termin*/
        long           subtype2_n;         /* noun subtype, def = 0    */
    } id_n;

```

```

        char          name_n [256];      /*                               */
    long      read_action;      /* action on load                */
    long      next_1;           /* next available ???            */
    long      next_2;           /* number for extention         */
    long      next_3;           /* noun ext.,noun definition*/
    long      value_1 ;         /*                               */
    long      value_2 ;         /*                               */
    long      value_3 ;         /*                               */
    double    double_1;        /*                               */
    double    double_2;        /*                               */
    double    double_3;        /*                               */
    char      reserve_1[41];    /*                               */
    char      reserve_2[41];    /*                               */
    char      free[5001];       /*                               */
}

/*****
/* Record type : noun
/* Description : names (views,names,contexts)
*****/

record noun
{
    unique key struct
    {
        long      type;         /* noun type, def = 0          */
        char      kname [41];   /* noun 40B + 1B null termin*/
        long      subtype;      /* noun subtype, def = 0       */
        long      type2;        /* noun 2 type, def = 0        */
        char      kname2 [41];   /* noun 40B + 1B null termin*/
        long      subtype2;     /* noun subtype, def = 0       */
    } id;
    char          name[256];     /* 255+1                        */
    struct
    {
        long      type_p;       /* noun type, pair id          */
        char      kname_p [41]; /* noun 40B + 1B null termin*/
        long      subtype_p;    /* noun subtype, def = 0       */
    } id_p;
    long      cf;               /* certainty factor            */
    long      delete;           /*                               */
    long      joint_id;         /* neuron||joint              long */
    long      read_action;      /* action on read              */
    double    date_create;      /*                               */
    double    date_when;        /*                               */
    double    date_done;        /*                               */
    double    date_start;       /*                               */
    double    date_end;         /*                               */
    char      short_name [21];   /*                               1B null termin*/
    char      cat_type [11];     /*                               1B null termin*/
    char      exclusive [2];     /*                               1B null termin*/
    char      settings [41];     /*                               1B null termin*/
    long      layout_link;      /* type of layout for linked note*/
    struct
    {
        long      type_link;     /* link to extention which     */
        char      kname_link [41];/* is in note                  */
        long      subtype_link;  /*reserve the range of notes*/
    } id_link;
}

```

```

struct
{
    long    type_note;          /* note id          */
    char    kname_note [41];    /* note name        */
    long    subtype_note;       /* note page        */
} id_note;
    long    position_note;      /*          in document/page */
    char    free_1  [101];
    char    free_2  [101];
    char    reserve_1[21];       /*3 sets person company */
    char    reserve_2[11];       /*          notes (commence) */
    char    reserve_3[11];       /*          notes (commence) */
}
/*****
/* Record type : datar
/* Description : records from Brain Agenda
*****/
record datar
{
    unique key struct
    {
        long    type;          /* data type, def = 0      */
        char    kname [41];    /* data 40B + 1B null termin*/
        long    subtype;       /* data subtype, def = 0   */
    } id;
    char    name[256]; /* 255+1
        long    cf;          /* certainty factor      */
        long    delete;      /*
        long    joint_id;     /* neuron||joint        long */
        long    read_action;   /* action on read        */
        double  date_create;    /*
        double  date_when;     /*
        double  date_done;     /*
        double  date_start;    /*
        double  date_end;      /*
        char    settings [41]; /*          1B null termin*/
    }
    struct
    {
        long    type_note;          /* note id          */
        char    kname_note [41];    /* note name        */
        long    subtype_note;       /* note page        */
    } id_note;
        long    position_note;      /*          in document/page */
        long    long_1;              /*
        char    reserve_1[11];       /*
        char    reserve_2[11];       /*
        char    reserve_3[11];       /*
        char    reserve_4[11];       /*
    }
/*****
/* Record type : datar_tabl
/* Description : data tables
*****/
record datar_tabl
{
    long    elem [120];          /* 120 elements      */
    long    cf;                  /* certainty factor   */

```



```

        long    delete;                /* */
        double  date_create;            /* */
        long    read_action;            /* action on read */
        double  double_1;               /* */
        char    reserve_1[11];          /* */
        char    reserve_2[21];          /* */
    }
/*****
/* Record type : note */
/* Description : notes (pages ) document */
*****/
    record note
    {
        unique key struct
        {
            long    from;                /* doc id +datar,-name,0-user */
            long    type;                /* from record or name */
            char    kname [41];          /* chapter||paragraph||verse blank*/
            long    subtype;             /* for user=0 */
            long    page_nr;             /* page nr */
        } id;
        char    name [256];             /*
            long    cf;                  /* certainty factor */
            char    chapter [101];       /* left on page */
            char    chapter_1[101];      /* left on page */
            char    chapter_2[101];      /* left on page */
            char    chapter_3[101];      /* left on page */
            char    chapter_4[101];      /* left on page */
            char    chapter_5[101];      /* left on page */
            char    chapter_6[101];      /* left on page */
            long    verse;                /* left on page */
            char    page [5001];         /* page 5001 */
            long    delete;              /* */
            long    read_action;         /* action on read */
            char    reserve_1 [11];
            char    reserve_2 [11];
            char    reserve_3 [11];
            char    reserve_4 [11];
        }
/*****
/* Record type : noun_str */
/* Description : structure of the noun */
*****/
    record noun_str
    {
        long    cf;                    /* certainty factor */
        double  date_create;           /* */
        long    read_action;           /* action on read */
        double  double_1;               /* */
        char    reserve_2[11];          /* */
        char    reserve_3[11];          /* */
    }
/*****
/* Record type : noun_datar */
/* Description : relation noun - datar */
*****/
    record noun_datar

```

```

{
    long    cf;                /* certainty factor      */
    double  date_create;       /*                        */
    long    read_action;       /* action on read        */
    double  double_1;          /*                        */
    char    reserve_2[11];     /*                        */
    char    reserve_3[11];     /*                        */
}

/*****
/* Record type : action before
/* Description : must belong to the datar before being assigned to
/* the current datar
*****/
record action_before
{
    long    cf;                /* certainty factor      */
    double  date_create;       /*                        */
    long    read_action;       /* action on read        */
    double  double_1;          /*                        */
    char    reserve_2[11];     /*                        */
    char    reserve_3[11];     /*                        */
}

/*****
/* Record type : noun action after
/* Description : is assigned to noun after being assigned to
/* the current noun
*****/
record action_after
{
    long    cf;                /* certainty factor      */
    double  date_create;       /*                        */
    long    read_action;       /* action on read        */
    double  double_1;          /*                        */
    char    reserve_2[11];     /*                        */
    char    reserve_3[11];     /*                        */
}

/*****
/* Record type : noun_synonim
/* Description : all synonyms for a noun
*****/
record noun_synonim
{
    long    cf;                /* certainty factor      */
    double  date_create;       /*                        */
    long    read_action;       /* action on read        */
    double  double_1;          /*                        */
    char    reserve_2[11];     /*                        */
    char    reserve_3[11];     /*                        */
}

/*****
/* Record type : datar_str
/* Description : structure of the datar
*****/
record datar_str
{
    long    cf;                /* certainty factor      */
    double  date_create;       /*                        */

```

```

        long    read_action;          /* action on read          */
        double  double_1;             /*                          */
        char    reserve_2[11];        /*                          */
        char    reserve_3[11];        /*                          */
    }
/*****
/* Set type      : noun_set
/* Description : Search path for noun
*****/
    set noun_set
    {
        order descending;
        owner brain;
        member noun by cf;
    }
/*****
/* Set type      : datar set
/* Description : Search path for datar record
*****/
    set datar_set
    {
        order descending;
        owner noun;
        member noun_datar by cf;
    }
/*****
/* Set type      : datar_noun set
/* Description : Search path for noun from datar
*****/
    set datar_noun_set
    {
        order descending;
        owner datar;
        member noun_datar by cf;
    }
/*****
/* Set type      : noun_synonim_exp_set
/* Description : Search path for noun synonym explosion
*****/
    set noun_synonim_exp_set
    {
        order descending;
        owner noun;
        member noun_synonim by cf;
    }
/*****
/* Set type      : noun_synonim_imp_set
/* Description : Search path for noun synonym implosion
*****/
    set noun_synonim_imp_set
    {
        order descending;
        owner noun;
        member noun_synonim by cf;
    }
/*****
/* Set type      : noun_exp_set
*/

```

```

/* Description : Search path for noun explosion */
/*****
set noun_exp_set
{
    order descending;
    owner noun;
    member noun_str by cf;
}
*****/
/* Set type      : noun_imp_set */
/* Description : Search path for noun record from noun_str */
/*****
set noun_imp_set
{
    order descending;
    owner noun;
    member noun_str by cf;
}
*****/
/* Set type      : datar_exp_set */
/* Description : Search path for datar explosion */
/*****
set datar_exp_set
{
    order descending;
    owner datar;
    member datar_str by cf;
}
*****/
/* Set type      : datar_imp_set */
/* Description : Search path for datar record from datar_str */
/*****
set datar_imp_set
{
    order descending;
    owner datar;
    member datar_str by cf;
}
*****/
/* Set type      : action_before_exp set */
/* Description : Search path for action_before from noun */
/*****
set action_before_exp_set
{
    order descending;
    owner noun;
    member action_before by cf;
}
*****/
/* Set type      : action_before_imp set */
/* Description : Search path for action_before from noun */
/*****
set action_before_imp_set
{
    order descending;
    owner noun;
    member action_before by cf;
}
*****/

```

```

    }
/*****
/* Set type      : action_after_exp set
/* Description : Search path for action_after from noun
*****/
    set action_after_exp_set
    {
        order descending;
        owner noun;
        member action_after by cf;
    }
/*****
/* Set type      : action_after_imp set
/* Description : Search path for action_after from noun
*****/
    set action_after_imp_set
    {
        order descending;
        owner noun;
        member action_after by cf;
    }
/*****
/* Set type      : datar_tabl_set
/* Description : Search path for datar_tabl from datar
*****/
    set datar_tabl_set
    {
        order descending;
        owner datar;
        member datar_tabl by cf;
    }
/* 1000-0-00-00-00 */
}
/*****
/* End of Schema; Brain Agenda
*****/

```

Figure 17. The RAIMA® Database Data Definition Language Schema for BrainAgenda®.

Objects and Advantages

The object of the invention is to reduce redundancy of data storage, improve the performance of retrieving data and automate the process of categorizing information the way similar to human brain categorization.

Accordingly, several objects and advantages of the invention are:

1. A network database design, which easily categorizes and stores any number of pieces of information.
2. A database basic operation algorithms closely related to the database structure. The specific database design puts organization and structure to the way the specific pieces of information can be stored and browsed.
3. A database cross-referencing automatic algorithms are based on the database design, which stores any relationships between categories and items, categories and categories, items and items.
4. A database self-organizing and self-learning algorithms store statistical access or other information used to reorganize access paths to specific categories, items and their relationships. This information may be changed.
5. The look and feel of the user interface to the database. The interface uses a spreadsheet parallel to display in rows hierarchy of categories and items related to these categories. In spreadsheet columns are displayed categories which may be related to the items through other categories, which generally are sub-categories of the column categories.
6. Name and Context Combo in the user interface to the database. To accommodate display of different categories (Names) which may have the same Name, but a different meaning depending on the context they are used, the display includes means of viewing and manipulating Name/Context combinations.
7. A computer software program embodying a computer code for Personal Information Manager, said program comprising of subroutines for entering, viewing and editing of user's data with the spreadsheet interface, for retrieving of user's data with automatic cross-referencing of data and for system's self-learning based on statistical access information.

Still further objects and advantages will become apparent from a consideration of the ensuing description and accompanying drawings.

Concepts of Database

All drawings and preferred embodiment Data Definition Language use standard notation developed by the CODASYL Database Committee. The rectangular boxes represent Record Types, arrows represent Relationships between Records. Each arrow represents one to many relationship.

The main parts of the Database description are:

- Category Structure
- Categorizing Information
- Elements of Simplified Database
- Elements of Database
- Sample of the better developed Database
- Theory behind the Database
- Basic Cross-Referencing Algorithms of the Database
- Self Learning Algorithms of the Database

Category Structure

A database user builds his/her business by knowing his/her products and the procedures to deliver them. Database produces the Items of information (the product), by learning from user how user wants to find the Items (the procedure). The commonly used descriptors like date and time or the other preloaded Database categories do not need any explanation. But other categories may be at use only by a specific user's business, for example, manager's name or the names of companies a business is dealing with.

Database lets user put his/her knowledge into a structure, which is depicted in Figure 1. In a specific Context 1 user can define many Names 3. The Relationship 2 between Context and Name is one to many optional on both sides of the Relationship 2. For example, in Context Work a user can create Names of co-workers, Alex, Barbara, Jan and Agnes.

Each Name in the Database has a specific Context assigned to it at the time of creation of the Name in the Database.

A View 4 is a collection 5 of Names 6 (and their Contexts) as defined by the user at the time of the specific Name 6 entry. Context may also be used as a View.

Usually the View or Context 4 (or 7) is used to have a collection of Names 6 (or 9) in a required setup 5 (or 8). Then, within the View or Context the category structure is like on Figure 2. Each Name in View can be used in a different Context.

For example, a View Activity can contain Names: Calls, Meetings, Mail and Follow up; a View People can contain Names: Peter, Jack, Barbara, Tiffany, Mark and Ken.

It is recommended, that a user starts working with the structure as shown on the Figure 2, without using Names from contexts other than Global. When user sees the need for differentiating the meanings of a particular word in different contexts, then he/she can start to use different contexts.

For example, there is already created a View People with Names: Peter, Jack, Barbara, Tiffany, Mark and Ken, containing names of the people from the business. Then user entered an Item with the text "Call Barbara at 2:30 PM", meaning to call user's wife, which has the first name Barbara, same as one of user's coworkers. The system has assigned the Item "Call Barbara at 2:30" to Barbara from the business, because it didn't know about user's wife. Now, what user is supposed to do, is to add Barbara from View People, to a new Context Home. In effect, Barbara will be related to two Contexts, namely Work and Home.

Categorizing Information

User enters the pieces information to the system through Items 11 (109). Items are entered on the View Form (screen) as in Figure 18. User enters the Items 11 (109) for a Name 9 (106, 108). Each Item may be assigned 10 to many Names (106, 112). The full structure of Database system is shown on Figure 3.

User can create as many as he/she wishes Contexts, Views, to each View can be assigned many Names, and to each Name can be assigned many Items. Each Item may be assigned to many Names. There is no limit on how many of these elements can be created.

Contexts, Views and Names together create Categories 12. All Categories 12, all Items 14 and all many to many connections 13 between Categories and Items in Database are stored in Database called **Neuron**. The simplified structure of Database is depicted as shown in Figure 4.

The presented in Figure 3 and in Figure 4 structure of Database is totally flexible and extendible, because there can be created many levels of classification. For example, a user can have the structure of categories and an Item, as shown on Figure 5. In this Figure 5 arrows 16, 18, 20, 22, 23, 27, 28 and 29 depict the physical pointers between specific categories/items. These pointers are merely one of possible physical implementation of relationships.

In this example user has five categories: Activity 15, Follow Up 17, Leads 19, NOVACORP 21, Smith 22' and an Item "Call Smith tomorrow and meet him Monday" 30. Each of the categories can become a View and/or a Name. At the time of the entry the Item "Call Smith tomorrow and meet him Monday" is automatically assigned to other categories: Calls 24, Tomorrow 26, Meetings 25; and other standard (not shown here) date categories: Tomorrow's Date, Monday (next) and next Monday's Date. All categories can have their own structures or can participate in any structures. Together, all category structures in the Database reflect user's own information network.

Elements of Simplified Database

In the previous section **Categories 31** and **Items 36** were described. They are the most frequently used elements of Database. The **Notes 33** are the next element of Database. Notes are not utilized in the automatic assignments, like Items and Categories, but are useful to store the additional information attached to any Category or Item. As the Items are limited in size, to make their processing efficient, the Notes are actually unlimited in size. One note can have many pages, and one page contains around one printed page of text in the preferred embodiment. The number of notes is practically unlimited. Notes are attached 32, 35 to Categories and Items, but there can be also notes by themselves not connected to any other element of Database. However, it is recommended that Notes are attached to at least one Category or Item, because this way they can be easily found out. Otherwise, a user has to remember note's identifier or would have to scan all notes, to find the right one. Figure 6 shows how the Notes relate to other elements of Database.

The Simplified Database is made up of Items, Categories and Notes. All these database elements can be related to each other 32, 34, 35 in many to many relationships.

Elements of Database

The basic configuration of the Database allows to store any information. Categories are divided into Nouns and Verbs. A part of the Database is called the **Noun 37** branch, because all parts in this part are nouns. Similar structure is created for the verbs. This part of the Database is called the **Verb 38** branch. The full Database contains both branches being connected by **Item 41**. Use of one or both branches constitutes use of the Database. Figure 7 shows how all three elements relate to each other in the Database. Additional long pieces of text are stored in **Notes 42**. The many to many relationships **37''**, **39**, **40**, **37'** and **38'** relate Elements of Database to each other.

Sample of the better developed Database

In any database developed on the four element Database as shown in Figure 7, the branches get more complicated to store internal to the branches relationships and additionally relationships between the branches.

Full implementation of the invention should create two databases:

- one without Items — called Dictionary and
- one with Items — called Reality.

Figure 8 shows one of possible implementations of the Database developed with Items. The database has the **Start 43** record, which is used as the owner of the sets **44** and **62** for sequential retrieval of **Main Noun 45** and **Main Verb 63** records.

The Noun Branch is developed to classify and store the hierarchical and network relationships between the elements of the Noun Branch. **Main Noun record 45** is the owner of a collection **45'** of **Noun Group Records 46**. **Noun Group 46** is the owner of a collection **45''** of **Noun Records 49**. **Structure Record 47** is the record to store the many to many relationships **50** between **Noun Group Records 46**. These relationships **50** are implemented as a double set from **Noun Group Records 46** to **Structure Record 47**. **Structure Record 48** is the record to store the many to many relationships **51** between **Noun Records 49**. These relationships **51** are implemented as a double set from **Noun Records 49** to **Structure Record 48**. **Item Record 55** is related many to many to the **Noun Record 49** via **Noun-Item Relationship Record 53** and relations **54** and **54'**.

The Verb Branch is developed to classify and store the hierarchical and network relationships between the elements of the Verb Branch. **Main Verb record 63** is the owner of a collection **63'** of **Verb Group Records 64**. **Verb Group 64** is the owner of a collection **63''** of **Verb Records 65**. **Structure Record 66** is the record to store the many to many relationships **68** between **Verb Group Records 64**. These relationships **68** are implemented as a double set from **Verb Group Records 64** to **Structure Record 66**. **Structure Record 67** is the record to store the many to many relationships **69** between **Verb Records 65**. These relationships **69** are implemented as a double set from **Verb Records 65** to **Structure Record 67**. **Item Record 55** is related many to many to the **Verb Record 65** via **Verb-Item Relationship Record 72** and relations **73** and **73'**.

Structure Record 75 is the record to store the many to many relationships **74** between **Item Records 55**. These relationships **74** are implemented as a double set from **Item Records 55** to **Structure Record 75**.

Noun Record 49 is related many to many to the **Verb Record 65** via **Noun-Verb Relationship Record 71** and relations **52** and **70**.

Item 55 is further analyzed into **Item Analysis Records**. This schema has **Item Analysis Records 57**, **58**, **59** and **60**. **Item Analysis Records** are related to **Item Record 55** via relation(s) **56**. These relations may be implemented as a single set or multiple sets.

Note Record 61 in this schema is not related directly to **Noun 49**, **Verb 65** or **Item 55**. There are direct relations, but for efficiency reasons they are implemented as direct **Noun 49**, **Verb 65** or **Item 55** key duplication in **Note Record 61**.

Theory behind the Database

The Database follows theoretically the analysis of sentences in any language. Full sentence in any language contains Nouns, Verbs and quantified information about the noun operated by the verb. Such quantified information can be fully analyzed. Some sentences are not fully quantified, but logically they still follow the full model. (Parts are less than the whole).

By definition, elementary information is a simple sentence describing state of observed event or process.

Quantified elementary information, by definition, is a sentence with an argument describing result of measuring of an object state.

In the most complicated form a quantified elementary information contains results with discrete measurement result.

$$\text{Name} \left\{ \begin{array}{c} = \\ \leq \\ \geq \\ < \\ > \end{array} \right\} \text{Number} \quad (\text{any of})$$

Where:

Name – name for the Number

Number – Real Number

=, <=, >=, <, > – functors creating sentences, semantics like in theory of real numbers

Quantified elementary information is separated into three parts:

- Noun,
- Verb,
- Item.

Noun and Verb are analysis of the Name, Item contains the Number.

Using network data model notation (CODASYL) the model in Figure 9 directly translates quantified elementary information into a database language. Noun 76 is in many to many relationship 77 to Verb 78. Verb 78 is in many to many relationship 79 to Item 80.

This global data model is followed in all databases for quantified elementary information.

However, the described above analysis has mainly theoretical significance. In practice, it can be used to estimate the Database size.

Practically, the following schema should be utilized, see Figure 10. It is based mostly on the type of query directed towards the database. Also, in reality, multiple Nouns in quantified elementary information databases are analyzed in same Verbs – so Verbs are becoming independent of Nouns. Noun 81 is in many to many relationship 83 to Item 85. Verb 82 is in many to many relationship 84 to Item 85.

The Database is made of Nouns, Verbs and Items. What is critical in this diagram, are the relationships between the basic elements of the sentence. Names given to the basic elements of the

sentence are here only for clarity of definition. The essence of this design are the relationships between the parts of the analysis, not the specific names for them.

Based on the aforementioned, in Figure 10, schema using network model notation all systems will be build. In reality all the elements of the diagram become developed into finer analysis of them, to accommodate higher speed of retrieval within databases and to simplify the navigation in specific databases for a specific area of knowledge being analyzed.

To accomplish conversion from network model to relational model of databases, two relations are being defined:

1. Relation R1: N R1 V – in Noun N exists Verb V
2. Relation R2: V R2 I – in Verb V exists Item I

These two relations must coexist on the same set of Verbs, which is closed on the Product operation.

To have a properly build database, two thesis have to be true:

1. Each Item in the database has to be assigned to a Verb or combination of Verbs.
2. Each Verb has to be assigned to a Noun or combination of Nouns.

Simply speaking, there are no Items with nonexistent Verbs and/or Nouns.
The reverse functions also cooperate.

Basic Cross-Referencing Algorithms of the Database

The basic algorithms of the Database traverse the fully developed Noun and/or Verb branches to access the Items. Items by themselves can be accessed in a regular sort (index) sequence. To utilize the power of the Database the retrieval queries have to limit the number of retrieved Items based on the query parameters.

The sample of the Noun Branch is depicted in Figure 11. The basic query reads a Noun 86 as the specified View, takes it as the head of the Structure list 87 and scans all the elements belonging to the list using the Structure record using the connecting sets 86". The elements of the View list create the headings 92 of the result spreadsheet in Figure 12. Then, for a specified Name 94 with Context 94" treated as the head of another list it reads all the elements belonging to the Name list using the Structure record 87 and the connecting sets 86". Then, the connecting sets 86' and 89' and Noun-Item Relationship Record 88 is used to find out all Items 89 (93) belonging to the Name list elements; all the Nouns 86 for these Items are read and if any of these Nouns appear on the list which head is specified in the heading 92, then such Noun 86 (91) is printed in the intersection of the Item 89 (93) and the heading 92.

Same algorithm may be used to traverse the Verb Branch.

If the Database schema is developed as in Figure 8, then the basic algorithm can be extended to utilize the classifications of Nouns (Verbs), which are the records 45, 46 (63, 64) above the main Noun (Verb) records 49 (65).

Illustration of result of the queries is the screen printout in Figure 12. The expected result of the query is a logical intersection of View 90 with Name 94. Each returned Item 93 has to belong to sets: one is the View set 90 or its sub-name 92 and another is the Name set 94 or its sub-name 94'. This way the user is presented only with Items 93 that fulfill this two dimensional query parameters.

Self Learning Algorithms of the Database

Further referring to Figure 11, the lists 86", 86', 89' mentioned in the previous section for the Basic Cross-Referencing Algorithms of the Database are ordered by key value in records Structure 87 and Noun-Item Relationship Record 88. Same applies to all Structure and Relationship Records in all Figures. Every time the specific link between the lists is utilized, the key value is incremented by a discrete count. This count can be also inputted by user on request. This organizes the list and strengthens the connection between the list head and its element. The next time the same list gets read, the higher count, stronger elements are read first. This constitutes the self-learning process of the Database.

Basic structure of Noun (also Verb) record is presented in the Figure 13. It contains Context Code 95 and Noun (Verb) Name Value 96. For example, Context Code 0 (zero) for Global Context and Name with value 'New York'.

Figure 14 shows the minimal content of the Relationship (or Structure) record containing usage count or certainty factor 97.

The Noun (Verb) data is a Product of any number of multiple other Nouns (Verbs) and their Relationship usage counts 100, like in Figure 15. Nouns (Verbs) each carry Context Code 101 and Noun (Verb) Name Value 102.

Example given in Figure 16 contains Noun data, which is built from four other products of Noun Name Values 105 and their Contexts 104; and their relationship count 103.

Name and Context Combo and Spreadsheet Interface to the Database

Referring to Figure 18, visual representation of the Database content is provided. Each Name in the Database is stored not only as a value of its content, but also in conjunction with its Context. To let a user view and edit the content of such pair of objects, the Name and Context Combo is developed. In the preferred embodiment, the only existing implementation of the invention such Combo is represented by means of two closely visually related list boxes: List Box Name 106 and List Box Context 107. In other screens of the preferred embodiment Name and Context Combo can be shown as Name and Context columns of a screen. Other visualizations are may display the same content in a different layout.

Referring to Figure 18, visual representation of the Database content is also provided for multiple hierarchical and other relationships between Categories and Items. Each Name from the Database may have a list of sub-Names 108 (displayed here with the folder picture). These sub-Names may again be related to their sub-Names. Each Name or sub-Name may have Items 109 (displayed here with the page picture) related to them and displayed in proximity of such Name or sub-Name. The list of columns 110 is the list of Names to which a user wants to view relationships to Items. Such list of columns is named as View and such Name 111 is displayed in the View List Box 111. The Name(s) 112 displayed in the cell related to a row and column are the Name(s) relating the name(s) in the column heading 110 to a Name(s) or Item(s) in the related row 109 or 108.

For example, referring to Figure 18, Name "jackie" from Context "global" has Items "call alex soon", "see jackie", another "see jackie" and "call alex mondaa". Name "jackie" from Context "global" has also sub-Name "people". View "manager" has sub-Names (and columns) "contact", "people", "completed work1", "assigned date" and "alarm". Item "call alex soon" is related to column "people" through Name "alex", which is displayed in the intersection of the row for the Item and column for Name "people". Item "see jackie" is related to column "people" through Name "jackie", which is displayed in the intersection of the row for the Item and column for Name "people". Another Item "see jackie" is related to column "people" through Name "jackie", which is displayed in the intersection of the row for the Item and column for Name "people". Item "call alex mondaa" is related to column "alarm" through Name "call alex mondaa", which is displayed in the intersection of the row for the Item and column for Name "alarm".

Brief Description of the Drawings

- Figure 1. illustrates Category Structure dependencies for Context and Names.
Figure 2. shows Standard Category Structure for the View Context.
Figure 3. shows Structure of the Database Information Model.
Figure 4. is the diagram of the Simplified Structure of the Database Information Model.
Figure 5. shows structure of a sample category classification.
Figure 6. shows all Elements of the Simplified Database Information Model.
Figure 7. shows all Elements of the Database.
Figure 8. displays realistic schema of the Database for Reality.
Figure 9. is a diagrammatical representation of quantified elementary information.
Figure 10. is a diagrammatical representation of all elements of the quantified elementary information.
Figure 11. contains illustration for the basic retrieval algorithm.
Figure 12. displays two dimensional query results of the basic retrieval algorithm.
Figure 13. shows basic structure of Noun (Verb) record.
Figure 14. shows basic structure of Relationship (or Structure) record containing usage count or certainty factor.
Figure 15. displays product of Nouns (Verbs) and Structure of Nouns (Verbs); with three elements.
Figure 16. shows example of product of Nouns (Verbs) and Structure of Nouns (Verbs); with four elements.
Figure 17. contains the RAIMA® Database Data Definition Language Schema for BrainAgenda®.
Figure 18. displays two dimensional query results of the basic retrieval algorithm and shows spreadsheet interface. The Name and Context Combo is displayed.

Summary Including Objects and Advantages

This invention is a specific software and/or hardware Database (Database) design and algorithms to access information in this Database. The Database is a model of the reality. The most prevalent characteristic of the Database is its **self-organizing** of information contained in the Database. The Database content is dynamic and effectively **changing the Database itself**. Humans always use **words** and phrases to describe the reality. The sentences are build primarily with **nouns** and **verbs**. The meaning of what is said depends on the **context** in which words are used, then it is concentrated on a particular **view** of the things and finally the things have their names. Database uses these words to classify the information. It is intuitive, but if somebody prefers to use a different naming convention, the Database can be adjusted by customizing it. The Database includes automatic cross-referencing algorithms to relate categories and items of information. Main design views of the Database are presented here – others, not presented here variations of main design are covered also by this invention. The look and feel of the computer programs which deal with user friendly presentation of the Database information and particularly Name and Context Combo are described. A computer system with means of implementing the invention is also described.

Preferred Embodiment – Detailed Description

Detailed descriptions of the preferred embodiment are provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure or manner.

The preferred embodiment is to be done using a Microsoft Windows® compatible computer. On such computer a Network Model Database Manager software has to be installed. Database definition for a Network Model Database Manager is stored in the Data Definition Language format file. The only existing embodiment of the invention is in BrainAgenda® Personal Information Manager software. The Data Definition Language format file is created using RAIMA® Network Model Database Manager. Figure 17 show the Data Definition Language format file specific to and working with RAIMA® Network Model Database Manager. The Data Definition Language format file stores the database definition, which directly relates to some claims of the invention. This file is called a Schema of the Database.

Computer Database Manager Listing for the Database Design is represented in Figure 17. This is a Network Model Database design using a specific RAIMA® Database Manager. The Database Design may be directly implemented in a specific computer by supplying the Listing to the RAIMA® Database Manager. This schema is the implementation of realistic schema of the Database for Reality as shown in Figure 8. Additional elements included in the schema and not represented in the Figure 8 are utilized mostly for performance improvement.

In Figure 17 all lines and each string starting with two characters / (forward slash) and * (asterisk) and ending with * (asterisk) and / (forward slash) are the comment lines or strings. Comment string contains text which helps a database analyst understand database features. Comment text is irrelevant to the database manager interpretation of the database definition.

In this description the references are done by the name of the element as it is used in the Figure 17. The database **BRAIN** is defined with the page size of 6144 bytes of storage. The file **F100010.00** contains records of type **noun**. The file **F100011.00** contains records of type **datar** and **datar_tab1**. The file **F100012.00** contains records of type **noun_datar**, **noun_str**, **noun_synonim**, **datar_str**, **action_before** and **action_after**. The file **F100019.00** contains records of type **brain** and **note**. The key file **F100010.00K** contains keys of type **noun.id**. The key file **F100011.00K** contains keys of type **datar.id**. The key file **F100019.00K** contains keys of type **note.id**.

Field types are defined as per language C conventions as **char** (character) with length in brackets, **long** (numerical) and **double** (numerical, with double size). The **struct** keyword is used to designate the structure name, which includes multiple fields. The structure name may be used in programming language (for example, C) to manipulate the whole named group of fields instead of single fields. The structure name does not change the way the included fields behave.

Definition for record type **brain** contains multiple fields **db_path**, **db_name**, **type_v**, **kname_v**, **subtype_v**, **name_v**, **type_n**, **kname_n**, **subtype_n**, **type2_n**, **kname2_n**, **subtype2_n**, **name_n**, **read_action**, **next_1**, **next_2**, **next_3**, **value_1**, **value_2**, **value_3**, **double_1**, **double_2**, **double_3**, **reserve_1**, **reserve_2**, **free**, which are not specifically related to the invention. These fields are defined for ease of programming to store some additional information related to the database as a whole.

Definition for record type **brain** contains also groups of fields **id_v** and **id_n**.

[illegible]

Definition for record type `datax_tab1` contains multiple fields `elem`, `cf`, `delete`, `date create`, `read action`, `double_1`, `reserve_1`, `reserve_2`.

Definition for record types noun_str, noun_datar, datar_str contains multiple fields cf, date_create, read_action, double_1, reserve_2, reserve_3. Field cf relates to basic structure of Relationship (or Structure) record containing usage count or certainty factor as shown in Figure 14 Count 97. In the Preferred Embodiment is implemented product of Nouns (Verbs) and Structure of Nouns (Verbs) with elements as related to Figure 15. As related to Figure 15, Count 1 or Count 2 or Count 3 100 relates to field cf. Definition for record types noun_str, noun_datar, datar_str relates directly to Structure records 48, 53, 75.

All sets in the schema are ordered descending by the `cf` fields from the member records.
 Definition for set `noun_set` contains record `brain` as the owner and record `noun` as the member.
 Definition for set `datar_set` contains record `noun` as the owner and record `noun_datar` as the member.
 Definition for set `datar_noun_set` contains record `datar` as the owner and record `noun_datar` as the member.

Definition for set `noun_synonim_exp_set` contains record `noun` as the owner and record `noun_synonim` as the member.

Definition for set `noun_synonim_imp_set` contains record `noun` as the owner and record `noun_synonim` as the member.

Definition for set `noun_exp_set` contains record `noun` as the owner and record `noun_str` as the member.

Definition for set `noun_imp_set` contains record `noun` as the owner and record `noun_str` as the member.

Definition for set `datar_exp_set` contains record `datar` as the owner and record `datar_str` as the member.

Definition for set `datar_imp_set` contains record `datar` as the owner and record `datar_str` as the member.

Definition for set `action_before_exp_set` contains record `noun` as the owner and record `action_before` as the member.

Definition for set `action_before_imp_set` contains record `noun` as the owner and record `action_before` as the member.

Definition for set `action_after_exp_set` contains record `noun` as the owner and record `action_after` as the member.

Definition for set `action_after_imp_set` contains record `noun` as the owner and record `action_after` as the member.

Definition for set `datar_tabl_set` contains record `datar` as the owner and record `datar_tabl` as the member.

While the invention has been described in connection with a preferred embodiment, it is not intended to limit the scope of the invention to the particular form set forth, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

Preferred Embodiment -- Operation

Algorithms of the Database described in this invention are implemented in BrainAgenda©. Specific source code of programs which perform the algorithms is written for the current usage of the Database in the Personal Information Manager operation.

The basic algorithms of the Database traverse the fully developed Noun and/or Verb branches to access the Items. Items themselves can be accessed only in a regular sort (index) sequence. To utilize the power of the Database the retrieval queries have to limit the number of retrieved Items based on the query parameters. Good illustration of result of the queries is the screen print in Figure 12. The expected result of the query is a logical intersection of View (and Context) with Names (and their Contexts). Each returned Item has to belong to two sets: one is the View set and another is the Name set. This way the user is presented only with Items that fulfill said two dimensional query parameters.

Referring to Figures 8, 12 and 18, the basic query reads a Noun Record (49, `noun`) as the specified View (111), takes it as the head of the list and scans all the elements belonging to the list using the STRUCTURE (48, `noun_str`) record. The elements of the View list create the headings (110) of the result spreadsheet. Then, for the specified Name (and Context) reads a Noun Record (49, `noun`) treated as the head of another list it reads all the elements (108) belonging to the Name list using the

STRUCTURE (48, noun_str) record. Then, for all the Items (55, data, 109) belonging to the Name list elements all the Nouns (49, noun, 112) are read and if any of the these Nouns appear on the list which head is specified in the heading (110), than such Noun is printed in the intersection (112) of the Item and the heading.

Same algorithm may be used to traverse the Verb branch. The basic algorithm can be extended to utilize the classifications of Nouns (Verbs) – the records above the main Noun (Verb) records.

Other Embodiments

Intelligent Device -- Description

Any intelligent Device has to have Knowledge Bank. This Knowledge Bank may be implemented in the computer by utilizing database as described in this invention.

Intelligent Device -- Operation

Any intelligent Device has to have Knowledge Bank. This Knowledge Bank may be implemented in the computer by utilizing database operation algorithms as described in this invention.

Conclusions, Ramifications, and Scope

Accordingly, it can be seen that this database design allows a system, which uses the invention, to perform highly effective storage of any number of pieces of information and their relationships to other pieces of information. As such the invention may be, and is, utilized for storage of dissimilar pieces of information in practical implementations especially useful for Information Managers and Knowledge Banks.

Although the description of the invention embodiment contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. Various other embodiments and ramifications are possible within invention's scope. For example, this database design allows a system, which uses the invention to perform highly effective storage of any language sentences (languages different than English). Above that, it also performs functions similar to human brain, namely, it stores unlimited number of connections between pieces of information, automatically cross-references them and self-organizes them according to any learning pattern, for example, frequency of usage of a piece of information in relationship to other pieces of information.

Any computer system with means of implementing the invention is said to be containing the invention. Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.

Claims

What is claimed is:

1. A database design, which categorizes and stores any number of pieces of information, comprising
means for storing database objects as defined in the schema of the database; this schema and its operation is described as using Noun Branch, Verb Branch, Item Branch and Note;
configuration of each Branch contains objects representing Noun, Verb, Item, Note respectively; Structure objects representing many to many relationships between elements inside each Branch; Structure objects representing many to many relationships between elements of different Branches;
the specific database design puts organization and structure to the way the specific pieces of information can be stored and browsed.
2. The system of claim 1, further comprising
means to execute the database basic automatic cross-referencing algorithm closely related to the database structure;
the basic automatic cross-referencing algorithm query reads a Noun object as the specified View, takes it as the head of the Structure list and scans all the elements belonging to the list using the Structure object; the elements of the View list create the headings of columns of the result spreadsheet; then, for a specified Name with Context treated as the head of another list it reads all the elements belonging to the Name list using the Structure object and puts them in rows of the spreadsheet; then, Noun-Item Relationship Structure object is used to find out all Items belonging to the Name list elements and puts them in rows of the spreadsheet; then, all the Nouns belonging to these Items are read and if any of the these Nouns appear on the list which head is specified in the heading of columns of the spreadsheet, than such Noun is printed in the intersection cell of the Item and the heading.
3. The system of claim 2, further comprising
means in the database to store the cross-referencing Structure data based on the database design, which stores any relationships between Categories, which include Nouns and Verbs, and Items, Categories and Categories, Items and Items;
the relationships are many to many relationships and relate the basic parts of the database, namely Nouns, Verbs, Items and Notes to each other.
4. The system of claim 3, further comprising
means in the database for self-organizing and self-learning algorithms storing statistical access or other information used to reorganize access paths to specific Categories, Items and their relationships.

5. The look and feel of the user interface to the database;
means to use a spreadsheet parallel to display in rows hierarchy of Categories and Items related to these Categories;
in spreadsheet columns headings are displayed Categories which may be related to the Items through other Categories, which generally are sub-Categories of the column Categories;
in spreadsheet cells are displayed Categories which may relate the Names or Items from rows to Categories from columns; which generally are sub-Categories of the column Categories.

6. The means to implement the Name and Context Combo in the user interface to the database;
to accommodate display of different Categories or Names which may have the same Name Value, but a different meaning depending on the Context they are used in, the display includes means of viewing and manipulating Name and Context combinations.

7. A computer software program embodying a computer code for Personal Information Manager, said program comprising:
a first subroutine for entering, viewing and editing of user's data with the spreadsheet interface;
a second subroutine for retrieving of user's data with automatic cross-referencing of data;
a third subroutine for system's self-learning based on statistical access or other information.


Self-Organizing and Automatically Cross-Referencing Information Management System

Abstract:

This invention is a specific software and/or hardware Database (Database) design and algorithms to access information in this Database. The Database is a model of the reality. The most prevalent characteristic of the Database is its **self-organizing** of information contained in the Database. The Database content is dynamic and effectively **changing the Database itself**. Humans always use **words** and phrases to describe the reality. The sentences are build primarily with **nouns** and **verbs**. The meaning of what is said depends on the **context** in which words are used, then it is concentrated on a particular **view** of the things and finally the things have their names. Database uses these words to classify the information. It is intuitive, but if somebody prefers to use a different naming convention, the Database can be adjusted by customizing it. The Database includes automatic cross-referencing algorithms to relate categories and items of information. Main design views of the Database are presented here — others, not presented here variations of main design are covered also by this invention. The look and feel of the computer programs which deal with user friendly spreadsheet presentation of the Database information and particularly Name and Context combo are described. Any computer system with means of implementing the invention is also described.

Keywords:

System Design and Learning, Database design, noun, verb, words, network model Database, self-organizing system, cross-referencing system, Database structure, learning, artificial intelligence, no redundancy, categorization, category, item, data, connection, spreadsheet interface for knowledge representation, Name and Context Combo.

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)	Attorney Docket Number	
	First Named Inventor	ALEXANDER SROKA
	COMPLETE IF KNOWN	
	Application Number	1 / 00
	Filing Date	8/10/00
	Group Art Unit	
<input checked="" type="checkbox"/> Declaration Submitted with Initial Filing	OR	<input type="checkbox"/> Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)
Examiner Name		

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Self-organizing and AUTOMATICALLY CROSS-REFERENCING INFORMATION MANAGEMENT SYSTEM

☒ the specification of which is attached hereto
OR
☐ was filed on (MM/DD/YYYY) [] as United States Application Number or PCT International Application Number [] and was amended on (MM/DD/YYYY) [] (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)

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[Page 1 of 2]

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DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
Self-organizing and Automatically Cross-Referencing Information Management Systems	8/10/00	

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

☐ Customer Number

OR

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Place Customer Number Bar Code Label here

Name	Registration Number	Name	Registration Number

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

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OR ☒ Correspondence address below

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:

☐ A petition has been filed for this unsigned inventor

Given Name (first and middle if any)		Family Name or Surname	
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Inventor's Signature	Date		8/10/00
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Post Office Address	FARMINGTON HILLS		
City		State	MI
		ZIP	48334
		Country	USA

☐ Additional inventors are being named on the supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto

In the United States Patent and Trademark Office

First/Sole Applicant: Alexander Sroka
Other Applicant(s): None
Title: "Self-Organizing and Automatically Cross-Referencing
Information Management System"

Small Entity Declaration - Independent Inventor(s)

As a below-named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35 United States Code, to the Patent and Trademark Office with regard to my above-identified invention described in the specification filed herewith. I have not assigned, granted, conveyed, or licensed and am under no obligation under any contract or law to assign, grant, convey, or license any rights in the invention to either (a) any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or (b) any concern which would not qualify as either (i) a small business concern under 37 CFR 1.9(d) or (ii) a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- (X) There is no such person, concern, or organization.
() Any applicable person, concern, or organization is listed below:

Full Name: None
Address: None

I acknowledge a duty to file, in the above application for patent, notification of any change in status resu CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Signature

Date

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8/10/00

Declaration for Utility or Design Patent Application

As a below-named inventor, I hereby declare that my residence, post office address, and citizenship are as stated below next to my name and that I believe that I am the original, first, and sole inventor [if only one name is listed below] or an original, first, and joint inventor [if plural names are listed below] of the subject matter which is claimed and for which a patent is sought on the invention, the specification of which is attached hereto and which has the following title:

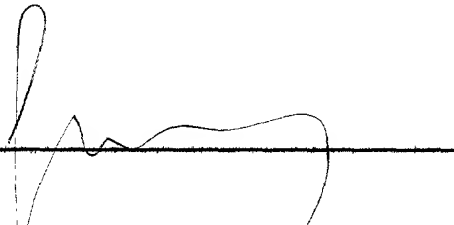
"Self-Organizing and Automatically Cross-Referencing Information Management System"

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to in the oath or declaration. I acknowledge a duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Section 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Please send correspondence and make telephone calls to the First Inventor below.

Signature



Date

8/10/00

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Sir:

Very respectfully,

Signature

Date _____

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